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TECHNICAL MEMORANDUM

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Combined Milestone III-IV for the
1604 Augmentation Communication Programs

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17 January 1963

Approved

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A

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CURRENT MODIFICATION

Modified Pages

11
13
14
18
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Notes and Filing Instructions *

Remove pages 11, 13, 14, 18, 19,
21 and 22 dated 20 December 1962.
Insert pages 11, 13, 14, 18, 19,
21 and 22 dated 17 January 1963.

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2. Normal Codes

A = 0	message read
A = 1	header read
A = 2	no more data (EOF found)

C. Bird Buffer - 1604 Transfer Tape

The Bird Buffer - 1604 Transfer Tape is a multiple file tape containing Headers, Tracking Messages, and Vehicle Time messages concerning any number of vehicles in any order.

Each set of data concerning a given Vehicle, Station, Revolution is a file and this file is begun by a Header record. All Messages and Headers are eight word records.

The tape is ended by two end of file marks.

See TM-(L)-834/000/01 for message formats.

V. ENVIRONMENT

SRDTRK uses TAPE.

SWRTOUT PROGRAM DESIGN

I. PROGRAM IDENTIFICATION

A. Title: Write Change Tape (SWRTOUT)

B. Calling Sequence:

L	RTJ	SWRTOUT
	N	B
L+1	ERROR RETURN	
L+2	NORMAL RETURN	

where "N" is number of words in buffer starting at location "B".

II. FUNCTION

The functions of SWRTOUT are as follows:

A. Accept message block inputs.

A message block consists of one or more like messages. The maximum number of words in a message block is 511.

B. Produce a Change Tape acceptable to SMERGE.

The tape used by SMERGE consists of two or more records and is ended by an end of file. The records are header messages, or message blocks.

III. OPERATING DESCRIPTION

SWRTOUT is entered by the user program with an RTJ instruction followed by two parameters; the "B" parameter specifying the location of the input message block and the "N" parameter specifying the number of words in the message block ($1 \leq N \leq 511$). If the message block is the same type (message code) of message as in the output buffer, and the new block can be accommodated in the buffer, the block will be transferred to the

buffer. If the types differ or the buffer is not large enough, the buffer will be written prior to the transfer of the new block to the buffer. The buffer will be written if an end of input flag is sensed and the buffer has not previously been emptied.

If SWRTOUT writes the buffer on the Change Tape, a complement checksum of the buffer will be added to the record written. If a block consists of commanding messages, SWRTOUT will reread the record and verify the block, using a word-by-word comparison of a one word input buffer and the original message.

If the conditions for writing the output buffer are not met, SWRTOUT will immediately return to the user program after transferring the message block to its own output buffer.

Upon receipt of the "end of input" flag, SWRTOUT will empty its buffer, write an end of file, and transfer to SMERGE via the COPII successor call. The Change Tape will be rewound.

All error recoveries will be attempted four times before an end return is taken by SWRTOUT.

IV. INPUT/OUTPUT

A. Input Parameters

1. "N" is the number of words in the block input buffer. "N" is nine bits and occupies bits 23-15 right justified.

An "N" of zero is the end of input flag.

SMERGE PROGRAM DESIGN

I. PROGRAM IDENTIFICATION

- A. Title: Merge Change and Transfer Tapes (SMERGE)
- B. Calling Sequence: SMERGE is called by a standard COP calling sequence with no parameters required.

II. FUNCTION

SMERGE will produce an updated 1604-160A Transfer Tape and a duplicate Backup Tape from the existing Transfer Tape and the Change Tape prepared by SWRTOUT. Initially, the existing Transfer Tape will contain only an end-of-file mark and the first updated Transfer Tape will consist of the information on the Change Tape sorted into the proper order. Thereafter, the existing Transfer Tape will be the updated Transfer Tape from the last time SMERGE was operated.

III. OPERATING DESCRIPTION

SMERGE will initially request the operator to remove the old Backup Tape and mount a blank. All tapes are then rewound. Changes will be read into memory from the Change Tape until an end of file is reached or until memory is filled.

The changes will then be sorted into order of message type within station within revolution within vehicle. An indirect sort will be used to limit the amount of data movement.

The Transfer Tape will then be merged with the changes in memory, writing the updated tape on the unit which held the old Backup Tape. Any message block on the existing transfer tape which has a corresponding entry on the Change Tape will be replaced by the new information. New message blocks for a particular vehicle, revolution, and station will be

added in order of message type.

At the end of the first pass, the operator will be requested to remove the old Transfer Tape and mount a blank. Additional merges will be required if the information on the Change Tape could not all fit in memory at one time. The input and output tapes for the merge would alternate between the Transfer and Backup Tapes. When the final merge is done, the updated Transfer Tape will be copied onto the Backup Tape and SMERGE will request the operator to file protect the new tapes before returning to COP.

If an unrecoverable read error occurs on the Change Tape, no recovery is possible. If an unrecoverable read error occurs on the first pass over the Transfer Tape, SMERGE will ask the operator to mount the Backup Tape and will start over. If an unrecoverable read error occurs on a subsequent pass, SMERGE will ask the operator to mount the old Transfer Tape and will start over. An unrecoverable write error will cause SMERGE to return to the beginning of the current merge, after asking the operator to mount a new output tape.

IV. INPUT/OUTPUT

A. Change Tape

The format of the Change Tape is described in SWRTOUT.

B. Transfer Tape

The records on the Transfer Tape are in the same format as the Change Tape, but they are ordered by message type within station within revolution within vehicle.

C. Backup Tape

The Backup Tape is a copy of the Transfer Tape.

V. ENVIRONMENT

A. Subroutines Used

TAPE

B. Tape Units Used

1. Transfer Tape. Tape Number 16
Channel 5/6, Cabinet 2, Unit 1
2. Backup Tape. Tape Number 17
Channel 5/6, Cabinet 2, Unit 2
3. Change Tape. Tape Number 18
Channel 5/6, Cabinet 2, Unit 3

C. Core Storage

Program - 750 words
Storage - Remainder of memory.

VI. RESTRICTIONS

- A. Tape Number 16 must be an existant Transfer Tape or a tape initialized by IRT.
- B. The code for message type cannot be 00.
- C. All blocks for a particular vehicle, revolution, station, and message type must appear contiguously on the Change Tape. Otherwise, the results will depend on whether or not the information on the Change Tape can all fit in memory at one time.

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REFERENCES

- A. TM-(L)-834/000/00, Bird Buffer Milestone III, 15 November 1962, System Development Corporation.
- B. TM-(L)-824/000/00, Combined Milestone III and IV for the Bird Buffer Utility Support System, 5 November 1962, System Development Corporation.
- C. N-(L)-19081/002/00*, Modification to COPII for Augmentation, 4 December 1962, System Development Corporation.
- D. TM-(L)-788/000/00, STOUT Milestone IV, 9 November 1962, System Development Corporation.

* Notes (N) are internal SDC documents and are ordinarily not released to outside Companies.

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Derango, W. C.	24077	Olson, M. M.	24124
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Dobbs, G. H.	24094B	Polk, R. W.	24099
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Greenwald, I. D.	24058B	Stone, E. S.	22116B
Haake, J. W.	24120	Sweeney, M. J.	24057
Henley, D. E.	24058A	Tennant, T. C.	27024
Hill, C. L.	24057	Thompson, J. W.	22077
Holzman, H. J.	22096B	Totschek, R. A.	24090A
Hudson, G. R.	22101	Tucker, A. E.	24115
Johnson, R. E.	24105	Weems, S.	24115
Kastama, P. T.	24053	Weinstock, M.	22095
Katz, M.	24109	West, G. D.	24117
Kayser, F. M.	25026	West, G. P.	24094A
Keddy, J. R.	25026	Williams, H. D.	24091

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System Development Corporation,
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COMBINED MILESTONE III-IV FOR THE
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